



सत्यमेव जयते  
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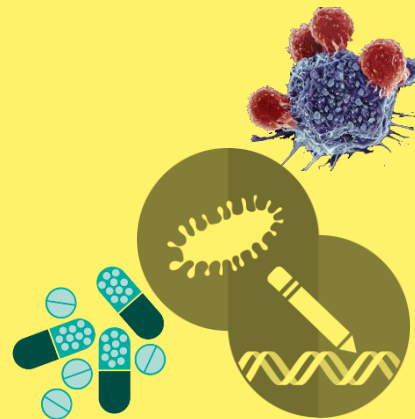
MHRD SPONSORED GIAN VIRTUAL COURSE ON

**NEW CONCEPTS IN TUMOR BIOLOGY:  
FROM THE BENCH TO BEDSIDE**

MAY 2022

**VENUE:**

*Department of Pharmaceutical Technology  
Centre for Excellence in Nanobio Translational Research (Autonomous)  
Anna University, Bharathidasan Institute of Technology Campus  
Tiruchirappalli, Tamil Nadu, INDIA.*





# ANNA UNIVERSITY

@ Chennai, T.N. India

Anna University, Chennai is one of the best ranked Technical University in India. It was recognised by UGC as an University with Potential for Excellence and identified by MHRD as an Institute of Eminence. Comprising 4 University Departments, 13 Constituent Colleges, 3 Regional Campuses and 593 Affiliated Colleges, Anna University offers 29 UG and 90 PG Programmes in Engineering, Technology, Architecture and Applied Sciences. Anna University strives to promote research and dissemination of knowledge gained therefrom.



# CENTRE FOR TECHNOLOGY DEVELOPMENT AND TRANSFER

@ Anna University, Chennai, T.N. India

Centre for Technology Development and Transfer strives to make Anna University an Institution of Excellence to serve the needs of the society through Research, Technology Development and Transfer. It encourages the faculty members and researchers to participate in Applied Research & Technology Transfer and facilitates them to transform the research output into Technology and its utilisation for public benefit.



# ANNA UNIVERSITY

@ BIT Campus, Tiruchirappalli, T.N. India

University College of Engineering, Tiruchirappalli was established as a Technical Institute in 1999 under Bharathidasan University and later on merged with Anna University, Chennai by the Government of Tamil Nadu. Anna University @ BIT Campus offers UG, PG and Research programmes in Engineering and Technology approved by UGC and AICTE in both English and Tamil. Anna University, BIT Campus caters to the educational needs of around 5000 students annually. It supports their academic, research, training, placement and other extension activities including NCC, NSS, YRC, NSA student clubs & forums to instill human values.



## D/O PHARMACEUTICAL TECHNOLOGY

@ AUBIT, Tiruchirappalli, T.N. India

Pharmaceutical Technology Department was established in 1999 offers unique degree programmes like B.Tech in Pharmaceutical Technology (approved by AICTE and accredited by the National Board of Accreditation), M.Tech in Biopharmaceutical Technology, and Ph.D. in Pharmaceutical Technology. The faculty members investigate many sponsored research projects to a tune of 16.00 crores INR supported by DST, DBT, ICMR, UGC, TNSCST etc. It houses the DST sponsored National Facility on Drug Development for Academia, Pharmaceutical and Allied Industries and National Facility on Bioactive Peptides from Milk. Pharmaceutical Technology department fetched DST-FIST grants for 1.6 crores INR established the Central Animal Facility and EDII-Anna Business Incubation Research Foundation. Considering the research achievements, Anna University, Chennai recognised this department as a Centre for Excellence in Nanobio Translational Research with Autonomy.

## COURSE OVERVIEW

Our understanding of biology of human cancers has greatly increased over the last decades. Very recently, modern high throughput technologies, especially next generation sequencing, have allowed to analyze human tumors in unprecedented detail. This has led to a completely new theory on tumor evolution, the punctuated equilibrium, that incorporates but also partially revises older concepts such as the two hits theory or the hallmarks of cancer development formulated respectively by Knudson and Hanahan & Weinberg. Understanding the natural evolution of human cancers is important for the design of therapeutic strategies and cancer prevention. The course will introduce current and past theories on cancer evolution and address how the predictions that derive there from affect future cancer research and therapy. At the same time, the development of immunotherapy has dramatically improved survival of cancer patients. For the first time in cancer therapy we observe complete remissions of patient with multiple metastases, for example in melanoma patients, rather than a mere extension of life with disease. However, the majority of patients still do not respond to immunotherapy or progress after an initial response. The causes of resistance to immunotherapy are manifold and reside in both, the tumor cell itself and the tumor microenvironment where immune cells and their exhaustion play a crucial role. Several strategies are being investigated to overcome pre-existing, acquired and adaptive resistance to immunotherapy among which the combination of immune checkpoint blockers with epigenetic drugs. The course will introduce state of the art immune therapy and address strategies aimed at increasing the percentage of responders, both in terms of ratio of patients responding and of duration of the response. Most of present cancer research is devoted to the therapy of metastatic cancers. With the exception of the recently introduced immunotherapies, this normally means to extend the life with metastatic disease. Primary prevention of cancer holds the potential to add years of healthy life for potential cancer patients thereby also reducing the disease associated costs for patients and health systems. Our increasing knowledge of the individual risk of a person, determined by genetic, environmental and life style factors, of the molecular make-up of the cancers to be prevented and the molecular mechanisms of natural and synthetic chemo preventive compounds will allow for the design of targeted chemoprevention strategies that can be combined with diet and life style interventions. The course will introduce the concept of targeted chemoprevention and discuss environmental and genetic risk factors for major cancers at the example of breast cancer.

## COURSE OBJECTIVES & SCHEDULE

Objectives of this course is to learn the fundamental and innovative concepts of tumor evolution, mechanisms of response and resistance to immunotherapy and innovative approaches to overcome resistance, genetic and environmental risk factors for cancer and to understand the concept of targeted prevention, learn innovative techniques for the analysis of the biology of human tumors and to discuss applications of the concepts learned to the management of patients in a specific socio-cultural and economic environment.

| Day        | Lecture /Tutorial | Duration | Content delivery  | Faculty |
|------------|-------------------|----------|---|---------|
| 06.05.2022 | L1                | 1 Hour   | Tumor evolution: Two hits theory and cancer hallmarks   | UP      |
|            | L2                | 1 Hour   | Tumor evolution: Punctuate equilibrium – The big bang hypothesis  | UP      |
|            | T1                | 2 Hours  | Hands on / Tutorial / Exercise: Analysis of tumor heterogeneity using next generation sequencing                      | UP      |
| 13.05.2022 | L3                | 1 Hour   | Fundamentals of immunotherapies for human cancers – Immune checkpoint blockers  | UP      |
|            | L4                | 1 Hour   | Fundamentals of immunotherapies for human cancers – Cancer vaccines and CAR-T   | UP      |
| 18.05.2022 | T3                | 2 Hours  | Hands on / Tutorial / Exercise: Case Study on immune checkpoint blockers  | PS      |
|            | L5                | 1 Hour   | Epigenetics of human cancers  | UP      |
|            | L6                | 1 Hour   | Epigenetics of the response to immunotherapy  | UP      |
|            | L7                | 1 Hour   | Methods of analysis of DNA-methylation  | UP      |
|            | T4                | 2 Hours  | Hands on / Tutorial / Exercise: Case Study on tumor epigenetics   | PS      |
| 20.05.2022 | L8                | 1 Hour   | Genetic and environmental risk factors for breast cancer  | UP      |
|            | L9                | 1 Hour   | Molecular mechanism of cancer chemoprevention   | UP      |
|            | L10               | 1 Hour   | The concept of targeted chemoprevention   | UP      |
| 25.05.2022 | T5                | 1 Hour   | Hands on / Tutorial / Exercise: Case study on drug repurposing, Aspirin for cancer prevention                         | UP      |
|            | L11               | 2 Hours  | New methods in cancer biology: gene editing, next generation sequencing, single cell transcriptomics, 3D cell culture | UP      |
|            | L12               | 1 Hour   | Breast cancer risk in India   | UP      |
|            | S1                | 1 Hour   | Self-assessment / review of the course  | UP & PS |

## COURSE FACULTY



**Dr. Ulrich Pfeffer** is Head of the Laboratory of Epigenetics of Tumors of the San Martino Hospital, Genoa, Italy, an Academic Hospital that is part of the National Program of Research Hospitals (Istituti di Ricovero e Cura a Carattere Scientifico) and Adjunct Professor for Bioinformatics at the University of Genoa. He received his Master degree in Biology in 1983 and his PhD in Molecular Biology in 1987 from the Free University of Berlin, Germany. From 1987 to 2011 he worked at the National Cancer Research Institute, Genoa, Italy. From then on, he is working at the San Martino Hospital, Genoa, Italy. He holds 38 years of rich professional and research experience.



## COURSE FACULTY



**Dr. Selvamani** is Professor at the Department of Pharmaceutical Technology, Anna University, Chennai, India. He received the Bachelor's degree in Pharmacy from The Tamil Nadu Dr.M.G.R. Medical University, Chennai and a Master's degree in Pharmacy and a Doctor of Philosophy in Pharmacy from Jadavpur University, Kolkata, India. His research interests are discovery and development of protein based pharmaceuticals, novel drug carriers using magnetic nanoparticles for targeted drug delivery for various conditions including cancer, rheumatoid arthritis and ulcer.

## ORGANISING COMMITTEE

### Chief Patron

**Prof. Dr. R. Velraj**

Hon'ble Vice-Chancellor, Anna University, Chennai

### Patrons

**Prof. Dr. G. Ravikumar**

Registrar, Anna University, Chennai

**Prof. Dr. P. Hariharan**

Director, CCC, Anna University, Chennai

### Advisors

**Prof. Dr. N. Balasubramanian**

Director, CTDT and GIAN-Local Coordinator, Anna University, Chennai

**Prof. Dr. T. Senthilkumar,**

Dean, Anna University, BIT Campus, Tiruchirappalli

### Course Coordinator

**Prof. Dr. P. Selvamani**

D/o Pharmaceutical Technology, Anna University, BIT Campus, Tiruchirappalli

### Members

**Dr.A.Puratchikody**, Prof & Head, **Prof.Dr.K.Ruckmani**, **Dr.E.Sanmugapriya**, Asso.Prof., **Dr.S.Latha**, Asso.Prof., **Dr.R.Vijaya**, **Dr.A.Shanmugarathinam**, **Dr.A.Umamaheswari**, **Dr.P.Senthamil Selvan**, **Dr.K.Kavitha**, **Dr.S.Lakshmanaprabu**, **Dr.R.Vijayalakshmi**, Assistant Professors, D/o Pharmaceutical Technology, Anna University, BIT Campus, Tiruchirappalli



# RESEARCH GRANTEES



सत्यमेव जयते

Ministry of Electronics and  
Information Technology  
Government of India



सत्यमेव जयते

Department of Science & Technology  
Govt. of India



सत्यमेव जयते

DEPARTMENT OF BIOTECHNOLOGY  
GOVERNMENT OF INDIA



सत्यमेव जयते

Government of India  
Ministry of Human Resource  
Development



ज्ञान-विज्ञान विमुक्तये



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# DAAD

Deutscher Akademischer Austauschdienst  
German Academic Exchange Service



The Matsumae  
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Registration to the MHRD Sponsored GIAN Virtual Course on 'New Concepts in Tumor Biology: From the Bench to Bedside' scheduled during May 2022 can be made online in two steps

- (i) Registration in the GIAN web portal @ <http://gian.iitkgp.ac.in/GREGN/index>
- (ii) in this GIAN course website @ <https://sites.google.com/view/course-code-196020h01/home>

**Submit a copy of your registration form along with applicable payment and NOC from the Supervisor/Head of the Institution on or before 03.05.2022.**



Academic - UG & PG students – Rs.1000/- | Academic - Faculty Members & Research Scholars - Rs.2500/- | Industry/ Research Organization – Rs.3000/- Participants from Abroad – US \$ 500  
Payment as Demand Draft drawn in favour of “The Director CTDT, Anna University” payable at Chennai

**FOR ANY CLARIFICATIONS**

**Prof. Dr. P. Selvamani**

Coordinator – GIAN Virtual Course on NCTBBB

ANNA UNIVERSITY

Dept. of Pharmaceutical Technology & Centre for Excellence in Nanobio Translational Research (Autonomous)

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